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ABSTRACT

This report on Alzheimer's disease in North Dakota discusses the heightened awareness of the disease and the shift in the age structure as two possible reasons for the increase in recognized incidences of the disease. It explains the three epidemiological indices commonly used to describe a population in the study of dementing illnesses: mortality, prevalence, and incidence. National prevalence rates of senile dementia and Alzheimer's disease are presented and reasons for variations in the prevalence rates are cited, including methodological techniques, a lack of diagnostic specificity, differences in disease severity, and the sampling procedures used. The prevalence of Alzheimer's disease in North Dakota is then described. Methods used to project the prevalence of Alzheimer's disease in North Dakota residents aged 60 years and older for the period 1980 through 2000 are discussed. Medicare and Medicaid data obtained from hospital admissions records are presented which substantiate the trends suggested by the projections in the report: Alzheimer's disease is related to age, its connection with gender is unclear, and places with larger populations will have higher numbers of Alzheimer's disease patients. Implications of the report are discussed in the areas of the care of Alzheimer's disease patients, the public understanding of Alzheimer's disease, and the need for further research. Fourteen data tables are appended. Five pages of references are included. (NB)

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PROJECTED PREVALENCE OF ALZHEIMER'S DISEASE AMONG NORTH DAKOTA'S ELDERLY

By

Gary A. Goreham and Richard W. Rathge

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Glossary of Terms

Age-sex cohort - A group of individuals of the same sex who were born within the same period of time.

Alzheimer's disease - A presenile brain disorder of organic cause (development of tangled threadlike structures among the brain cells) which affects perception, cognition, and memory. Named after Alois Alzheimer who first described the syndrome.

Dementia - An impairment of mental functioning.

Incidence - A measure of the number of newly diagnosed cases.

Mortality - A measure of the number of deaths.

Multiple infarct dementia - A presenile brain disorder of organic cause (obstruction of blood circulation in the brain by a thrombus or embolus) which affects perception, cognition, and memory.

Prevalence - A measure of the number of all diagnosed cases.

Projection - A mathematical calculation of future populations for a specified geographic area based on assumptions concerning birth, death, and migration rates.

Senile Dementia (SD) - A general impairment of mental functioning associated with old age.

Senile Dementia, Alzheimer's Type (SDAT) - See Alzheimer's disease.

PROJECTED PREVALENCE OF ALZHEIMER'S DISEASE AMONG NORTH DAKOTA'S ELDERLY

Gary A. Goreham and Richard W. Rathge

Alzheimer's Disease has been called "the disease of the century" (Thomas 1981), a malady which is "approaching epidemic proportions" (Plum 1979). Alzheimer's Disease is a degenerative disorder. The disease was first reported by Alois Alzheimer at the turn of the century (Alzheimer 1907). It begins with a loss of recent memory. This is followed by difficulties with abstraction, problem solving, and judgment. After an average of eight to ten years of progressive degeneration, aphasia, and apraxias, a vegetative state is usually reached. The condition is irreversible.

Although the reason for an increased incidence of the disease is unresolved, two factors are likely to have played a major role in the upswing in reported cases. The first is a heightened awareness of the disease. Evidence of this can be found in expanded television and press coverage, the founding of the Alzheimer's Disease and Related Disorders Association and the Alzheimer Society, the emergence of hundreds of self-help and support groups, an increase in the number of professional publications and reviews devoted to the subject, and the convening of congressional committees to investigate the matter (Terry and Katzman 1983). As more information concerning the disease becomes available, physicians' ability (and likelihood) to diagnose the disease increases, resulting in more reported cases. A second factor which is contributing to the increased incidence of Alzheimer's Disease is a shift in the age structure. As the pool of elderly enlarges in the United States, the incidence of Alzheimer's disease also grows because of its direct link to the aging process.

A growing number of neurologists currently believe that while Alzheimer's Disease is closely linked to Senile Dementia (SD), the two disorders represent two distinct nosological entities. However, since most surveys of dementia in elderly populations tend to treat Alzheimer's Disease as a subset of SD (Grufferman 1978), and Alzheimer's Disease is then referred to as Senile Dementia-Alzheimer's Type (SDAT), this term will be used throughout this report. These surveys estimate SDAT to comprise between 50 percent (Dans and Kerr 1979; White and Henderson 1986) to 70 percent (Roth 1980) of all SD cases. According to Roth (1980), an additional 15 to 25 percent of all SD cases may be of the multiple infarct dementia type.

Descriptive Epidemiological Indices

In the study of dementing illnesses, three epidemiological indices are commonly used to describe a population. These include mortality, prevalence, and incidence (Schoenberg 1977).

MORTALITY is a measure of the number of deaths which occur in a specific population (usually per 100 or per 1,000 persons) over a specified period of time (usually per year) in a given place which is attributable to a disease. Mortality rates are the most accurate of the epidemiological indices.

INCIDENCE is a measure of the number of NEWLY diagnosed cases of a disease for a specific population (usually per 100 or per 1,000 persons) over a specified period of time (usually per year) in a given place.

PREVALENCE is a measure of the number of ALL diagnosed cases of a disease for a specific population (usually per 100 or per 1,000 persons) over a specified period of time (usually per year) or at a given point in time and in a given place. If a period of time is used, the measure is called a "period prevalence" whereas if a point in time is used, the measure is called a "point prevalence." Prevalence rates are the best estimates of a disease's importance as a public health problem (Sluss, Gruenber, and Kramer 1981).

Prevalence Rates of Senile Dementia and Alzheimer's Disease

There are at least two million persons in the United States suffering from various forms of dementia. The actual number could reach as high as five million persons. Dementia and related diseases account for nearly 75 percent of all first admissions to hospitals among elderly persons and may account for 70,000 to 110,000 deaths per year in the United States (Coull 1983).

The number of elderly aged 65 to 74 is expected to increase by 23 percent between the years 1980 and 2000. The number of persons between the ages of 75 and 84 is expected to increase by 57 percent, and the number of those 85 years old and over will nearly double (Brotman 1982). Dr. Robert M. Cook-Deegan, testified in 1984 at the House Committee on Science and Technology that there are currently 1.2 to 4 million Americans over age 65 with SDAT. Assuming that SDAT prevalence rates rise from about 2 or 3 percent of those aged 65 to 69 to 22 percent for those over age 80 and that nothing is found to control SDAT, the number of elderly Americans with SDAT could reach as high as four to eight million by the year 2030 (U.S. Congress, House 1984).

A review of the research literature on the prevalence of SDAT yields a range of estimated rates for the United States and northern Europe. Most of this research addresses SD rather than SDAT specifically. The prevalence rates found in these studies are listed in Appendix Table 1. The average prevalence rates of severe forms of dementia have been estimated to range from 1.3 percent to 6.2 percent of persons over age 65. Gruenberg (1978) points out that these average prevalence rates may not be useful because of vast differences in prevalence rates among age cohorts for the elderly.

Reliable estimates of SD prevalence rates for persons under age 65 are unavailable. This is likely due to three reasons. First, the condition manifests itself infrequently in younger populations. Second, reporting procedures are not uniform. Finally, it is difficult to screen the cognitive loss of a sufficiently large population (Mortimer 1983).

Reasons for Ranges in Prevalence Rates

Epidemiological studies of the prevalence rates of SD and SDAT have been conducted in a number of locations in the United States and abroad (Appendix Table 1). The results of these studies provide a range of prevalence rates. Variations in reported prevalence rates are due to a number of factors.

First, variations in prevalence rates are due to the different methodological techniques used to diagnose SDAT and SD. The three most common methods are clinical diagnosis, psychological tests, and autopsy. There are a number of advantages and disadvantages to each of these methods. Although clinical diagnosis is perhaps the most widely used method, it is less accurate than an autopsy. One study of autopsies found that about 20 percent of SDAT cases had been misdiagnosed as something other than SDAT. Difficulty in obtaining reliable histories from patients with SDAT has been an additional problem with clinical diagnosis. The accuracy of information on possible contributory factors such as family history, diet, cigarette or alcohol use, and history of infectious diseases is questionable (Grufferman 1978).

Psychiatrists believe clinical diagnosis may be a better predictor of SDAT than psychological tests such as the WAIS and other psychometric instruments. They maintain that clinical diagnosis offers richer information than psychological tests because of the clinician-patient interaction "in which the total mental state, including cognitive, personality, and emotional characteristics of the individual, can be correlated with his/her history and present state" (Roth 1978:337). Needless to say, this is a point of contention between psychiatrists and psychologists.

A second reason for differences in prevalence rates is the use of different criteria on which the diagnosis is based. The results of studies conducted in different countries vary because of discrepancies which exist between diagnostic definitions (Brocklehurst 1985). The lack of diagnostic specificity is a factor limiting the accuracy of epidemiological studies. This is apparent in that 30 to 40 percent of elderly patients with clinically diagnosable dementia do not manifest the pathologic changes characteristic of SDAT. As a result, specificity of the diagnosis is frequently uncertain (Alzheimer's Disease: Report of the Secretary's Task Force on Alzheimer's Disease 1984).

Third, the severity of the disease in research reports are often not comparable. For example, some researchers report "senile dementia" whereas others report "severe dementia" and "mild dementia." In still other cases, "organic brain syndrome" is compared with "senile dementia," "arteriosclerotic dementia," and "other severe brain syndromes."

Fourth, the method of selecting participants varies from study to study. In one case, the study population consisted of (1) persons referred to a psychiatric clinic, (2) residents of nursing homes, and (3) patients admitted to a general hospital (Nielsen 1961). How well such a sample represents the general population is an unresolved issue. Grufferman (1978) illustrates the problems inherent in selecting participants based on medical referral or institutionalization by noting that an "SDAT patient holding an important administrative position in a large corporation would probably be diagnosed

more readily or be more apt to reach medical attention than, for example, a laborer or a farmer in a rural area" (p. 36).

Variables Affecting the Prevalence of Alzheimer's Disease

Although age has been demonstrated to be an important variable associated with SDAT, a strong relationship between SDAT and other variables has not been established. One reason for the inability to determine other correlates of SDAT is that the sample size of those with SDAT is frequently too small to achieve statistical significance. Gruenberg (1978) recommends that research be conducted which would test hypothetical relationships between SDAT and a variety of factors. Variables to be examined include environmental differences (i.e., rural/urban residence, latitude, elevation above sea level) as well as personal characteristics (i.e., birth order, heredity, educational level, marital status, personality type, and prior illness).

Gender has been investigated for its relationship with SDAT. In his study of 711 persons in five geographical areas in England, Roth (1978) found gender differences in the prevalence of two types of dementia. Women had prevalence rates of SD nearly twice those of men. On the other hand, the prevalence rates for men with multi-infarct dementia were nearly twice that for women. That SD and multi-infarct dementia may not be two distinct nosological entities presents potential problems in using Roth's study as a basis for suggesting gender differences in dementia.

Prevalence of Alzheimer's Disease in North Dakota

The objective of the present report was to project the prevalence of SDAT in North Dakota residents aged 60 years and above for the period 1980 to 2000. To accomplish this objective, estimates of the elderly population were calculated by county for the years 1985, 1990, 1995, and 2000. The number of persons with SDAT was calculated by applying age-specific prevalence rates to the projected number of elderly persons for each time period by county.

Population projections were calculated using the age-sex cohort survival technique (Shryock and Siegel 1973). This technique involves subtracting the number of deaths and out-migrants and adding the number of in-migrants from a population for a given time period to determine the population for a subsequent time period. The present study made use of death rates based on a Life Table for North Dakota which used the average of the resident deaths for the combined years of 1979, 1980, and 1981 to control for unusual fluctuations in any given year.

Migration rates were calculated using the residual technique. This technique is based on the following formula.

$$\text{migrants}_{ab} = \text{pop}_{b} - \text{pop}_{a} - \text{deaths}_{ab} + \text{births}_{ab}$$

where

$migrants_{ab}$ = the number of persons from an age-sex cohort who migrated between the intial and ending time period

pop_{b} = the age-sex specific population for the initial time period

pop_{a} = the age-sex specific population for the end time period

$deaths_{ab}$ = the number of age-sex specific deaths between time periods a and b

$births_{ab}$ = the number of births occuring when the age-sex cohort begins with age 0

A positive number for $migrants_{ab}$ reflects in-migration while a negative number represents out-migration.

The number of in- or out-migrants is then used to determine a net migration rate using the following formula:

$$net\ migration_{ab} = \frac{migrants_{ab}}{pop_{a}} * 100$$

where $net\ migration_{ab}$ = an age-sex specific net migration rate

Data on the number of births by county and deaths by age, sex, and county were obtained from the North Dakota State Department of Health's vital statistics reports. Data on the number of persons by age, sex, and county for 1980 were obtained from the U.S. Census Bureau Summary Tape File 2-B. The figures given in Summary Tape File 2-B represent final counts of the 1980 census.

The number of persons in an age-sex cohort with SDAT was calculated by applying estimated prevalence rates of SDAT to the corresponding North Dakota age-sex cohorts. Two sets of rates were selected to represent a low and high estimate of the number of persons in the state with the disease. Both sets were selected because they were current reports and because they provided prevalence rates on five-year age cohorts.

The low-series estimates were based on the prevalence rates reported by Sayetta (1986) who developed single-age incidence and prevalence rates for persons aged 60 and over based on a sample of 518 persons from the Baltimore Longitudinal Study (BLS). Her calculations were made using data for the period 1958 to 1978. The BLS was conducted by the Gerontology Research Center, National Institute on Aging. It was designed to study the process of "normal" aging in humans. Participants in the BLS were volunteers who

regularly submitted to three-day medical, physiological, psychological, and sociological examinations. Using Sayetta's single-year age-specific SDAT prevalence rates, the following five-year prevalence rates were calculated.

Age	Prevalence Rate Per 1,000 Cohort Members
60-64	2.06
65-69	10.05
70-74	25.88
75-79	56.83
80-84	115.83
85-89	222.84
90-94	398.81
95+	536.14

High-series SDAT estimates used in this report were developed from the prevalence rates offered by Dr. Leonard L. Heston. Using the rural Swedish data reported by Adolfsson et al. (1981), Heston calculated the prevalence rates and reported them to the U.S. House of Representatives Subcommittee on Science and Technology on September 20, 1984. Adolfsson's study included 3,523 institutionalized men and women from Vasterbotten county, Sweden in 1975. Dementia was measured by use of a geriatric rating scale. Adolfsson's sample included only those patients with "severe" dementia. The prevalence rates reported by Heston are listed as follows:

Age	Prevalence of SDAT Per 1,000 Cohort Members
-69	13
70-74	28
75-79	72
80-84	132
85-89	237
90-94	429
95+	509

Prevalence rates offered by Heston may be somewhat inflated in that they are based on an institutionalized population rather than the general population. According to Kay and Bergmann (1980), at least 60 percent of nursing home residents have SDAT compared with about 7 percent of the total population of the same overall age group. However, if one recognizes that the incidence of SDAT increases with age as does elderly institutionalization, and that the average age of a person in a nursing home is over 80 (United States Department of Health, Education, and Welfare 1978), then Kay and Bergmann's arguments may be misleading since they do not provide age-specific comparisons. Nevertheless, the results of applying Heston's SDAT prevalence rates are similar to rates suggested by Dr. Lon White (1986) of the National Institute on Aging. He summarized the SDAT prevalence rates as follows. Individuals aged 65 to 74 have rates of about 4 percent; those aged 75 to 84 have rates of about 13 percent; and persons aged 85 and above have rates

nearing 30 percent. He believes that the SDAT prevalence rate is approximately 1 percent at age 60 and will double with every five years aging.

The prevalence rates were used as multipliers applied to each corresponding age-sex cohort. The estimated number of persons with SDAT by age, sex, and county for 1980, 1985, 1990, 1995, and 2000 using the Low-Series Estimates are listed in Appendix Tables 2 through 6. High-Series Estimates are reported in Appendix Table 7 through 11.

Dementia and Alzheimer's Disease Hospital Admissions

To determine how trends in the number of persons with Alzheimer's Disease projected in this report compared with actual diagnosed cases in the state, data were obtained from the North Dakota State Department of Health which listed Medicare/Medicaid hospital admissions (inpatient acute hospital, psychiatric units, swing beds, and rehabilitation units) in 1985 for which an International Classification of Diseases Code (ICDA) diagnosis indicated dementia. The dementia ICDA codes included all pre-senile, senile, and arteriosclerotic dementias (290.1-290.9), alcoholic dementia (291.2), amnestic syndrome (294.0), "dementia in conditions classified elsewhere" (294.1), "other specified organic brain syndrome (chronic)" (294.8), "unspecified organic brain syndrome (chronic)" (294.9), Alzheimer's Disease (331.0), Pick's Disease (331.1), senile degeneration of the brain (331.2), and "senility without mention of psychosis" (797).

Although prevalence rates based on this data set may not be generalized to the total elderly population in North Dakota, there are a number of similarities between it and the projections calculated in this report. First, the percentage of females admitted with any form of dementia or with Alzheimer's Disease is greater than the percentage of males with the corresponding diagnosis (see Appendix Table 12). However, this does not necessarily indicate a higher dementia prevalence among women age 60 and over. Nearly 55 percent of the North Dakota population age 60 and over are women, roughly the same percentage as those admitted to North Dakota hospitals with dementia (53.4 percent) or with Alzheimer's Disease (56.1 percent).

Secondly, whereas the percentage of persons in each age category of those over age 60 declined systematically, the percentage of those between 60 and 85 who were admitted to North Dakota hospitals with dementia or Alzheimer's Disease increased as age increased. However, after age 85, the percentage with dementia or with Alzheimer's Disease declined. This would seem to indicate that there is a relationship between those with dementia or Alzheimer's Disease and their age. The declining numbers of diagnosed dementia in the groups age 85 and over is indicative of the small number of persons in that age group; only 7.5 percent of the population age 60 and over is also age 85 and over.

Third, 123 persons age 60 and over were admitted to North Dakota hospitals with diagnoses of Alzheimer's Disease (ICDA 331.0) and 424 were admitted with all forms of dementia other than Alzheimer's Disease for a total of 547 persons. Thus, Alzheimer's Disease accounted for 22.49 percent

of all dementia patients entering North Dakota hospitals (see Appendix Table 13). This percentage differs from the 50 percent observed by Dans and Kerr (1979) and White and Henderson (1986) and from the 70 percent observed by Roth (1980). Part of this difference may be accounted for by the fact that these researchers considered the elderly population as a whole as opposed to a hospitalized group as the Department of Health data represents. There were 111 North Dakotans entering North Dakota hospitals with diagnosis of Alzheimer's Disease and 494 admitted with all forms of dementia. For North Dakota patients only, Alzheimer's Disease accounted for 22.47 percent of dementia patients.

Finally, the number of patients with Alzheimer's Disease as a percentage of all dementia who are admitted to hospital care is not evenly distributed from county to county. Eighteen counties had no Alzheimer's Disease patients in 1985, four of which had no dementia patients. Fifteen counties had only one Alzheimer's Disease patient in 1985. In the remaining 20 counties, the number of Alzheimer's Disease patients as a percentage of all dementia ranged from 6.25 percent in Ramsey County to 88.89 percent in Divide County.

Counties with larger populations reported higher numbers of dementia patients. These included Cass, Ward, Burleigh, Stutsman, Grand Forks, Stark, and Williams Counties with 47, 42, 36, 26, 23, 22, and 20 dementia patients, respectively. Cass, Morton, Pembina, Burleigh, Divide, Grand Forks, and Ward reported the highest numbers of Alzheimer's Disease patients with 13, 9, 9, 8, 8, 7, and 7 patients, respectively.

The largest number of out-of-state patients came from Minnesota. Of the 41 dementia patients from that state, 18 were from Clay County. Of the 10 Alzheimer's Disease patients, five were from Clay County.

In sum, the Medicare/Medicaid data subtantiate the trends suggested by the projections in this report. Alzheimer's Disease is related to age; its connection with gender is, as of yet, unclear; places with larger populations will have higher numbers of Alzheimer's Disease patients.

Implications of the Report

Care of Persons With Alzheimer's Disease

As shown in Appendix Tables 2 through 11, the number of persons with SDAT is projected to increase systematically between 1980 and 2000 (Figure 1). This rise is largely the result of a projected upswing in the number of elderly persons over that time span.

The increase in the number of persons with SDAT may have different effects on rural and urban counties due largely to shifts in the population structure.

Most rural counties in North Dakota are declining in population. Consequently, the aged-dependency ratio (proportion of persons over age 65 to persons aged 15 to 64) is increasing. The burden of SDAT victims on social service and medical facilities is likely to be heavier in rural counties whose

support base is low (i.e., high dependency rate) even though the projected number of persons with SDAT in some rural counties may rise at a very slow rate. Outside sources of financial assistance may be needed to provide care, programs, and facilities for those with SDAT.

The problems associated with SDAT faced by urban centers in North Dakota will likely be different than those faced by rural areas. As persons from rural areas gravitate to urban centers, North Dakota's urban centers will increase in population. This expansion will produce a change in the population structure. Both the elderly and those in their middle ages will grow in proportion. The influx of elderly persons may necessitate an

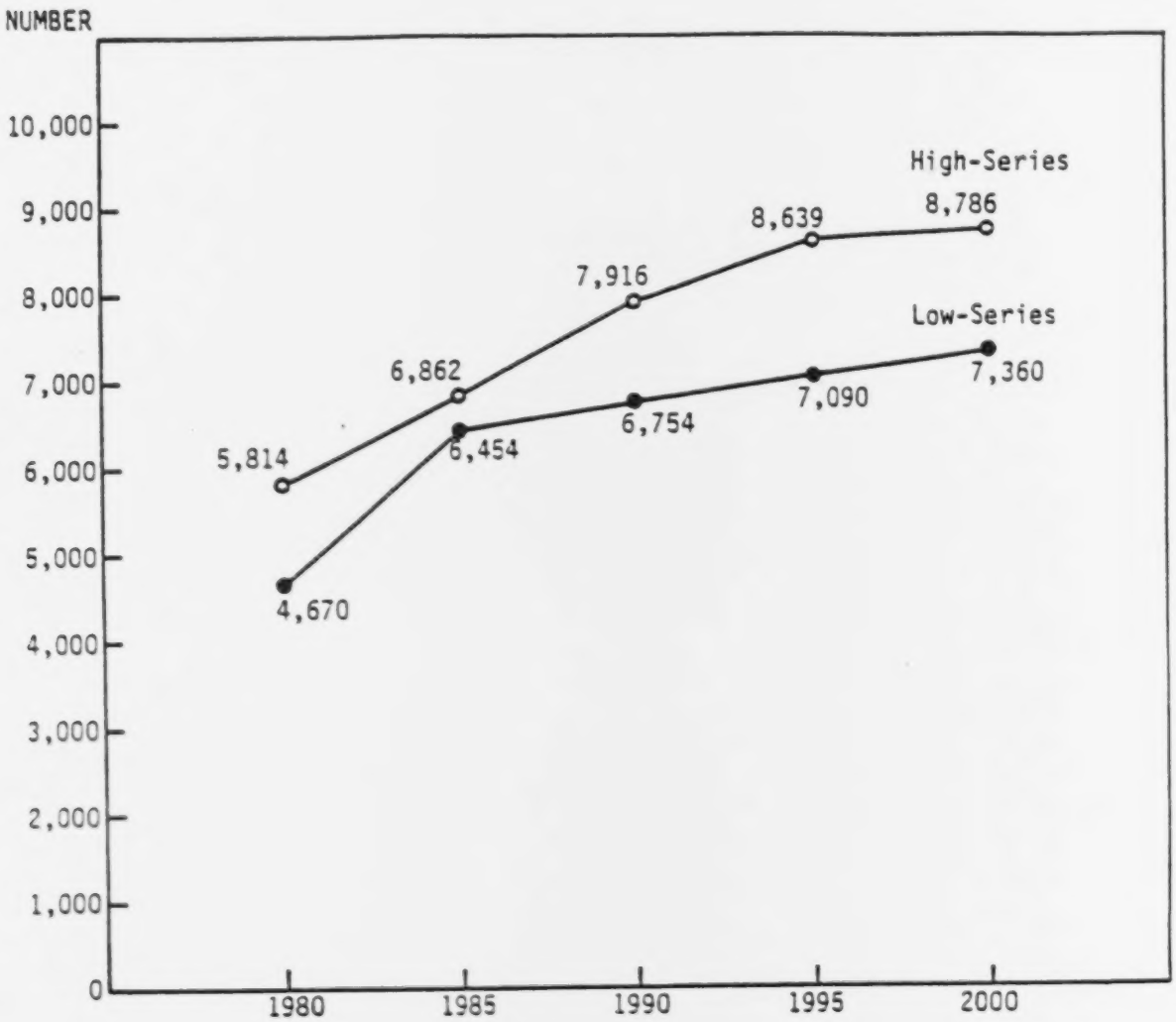


Figure 1. Number of North Dakotans Age 60 and Over With Alzheimer's Disease, Low- and High-Series Projections

expansion of programs and facilities available for persons with SDAT in these counties.

The purpose of this report was to project the potential number of SDAT cases in North Dakota between 1980 and 2000. Yet, determining the number of persons with all forms of dementia and their care needs remains a major issue. To grasp the magnitude of this issue, the number of persons projected in this report to have SDAT must be doubled (Dons and Kerr 1979; White and Henderson 1986). This would provide an estimate of the potential number of persons with all forms of dementia. Even then, the estimate would likely be conservative (Roth 1980).

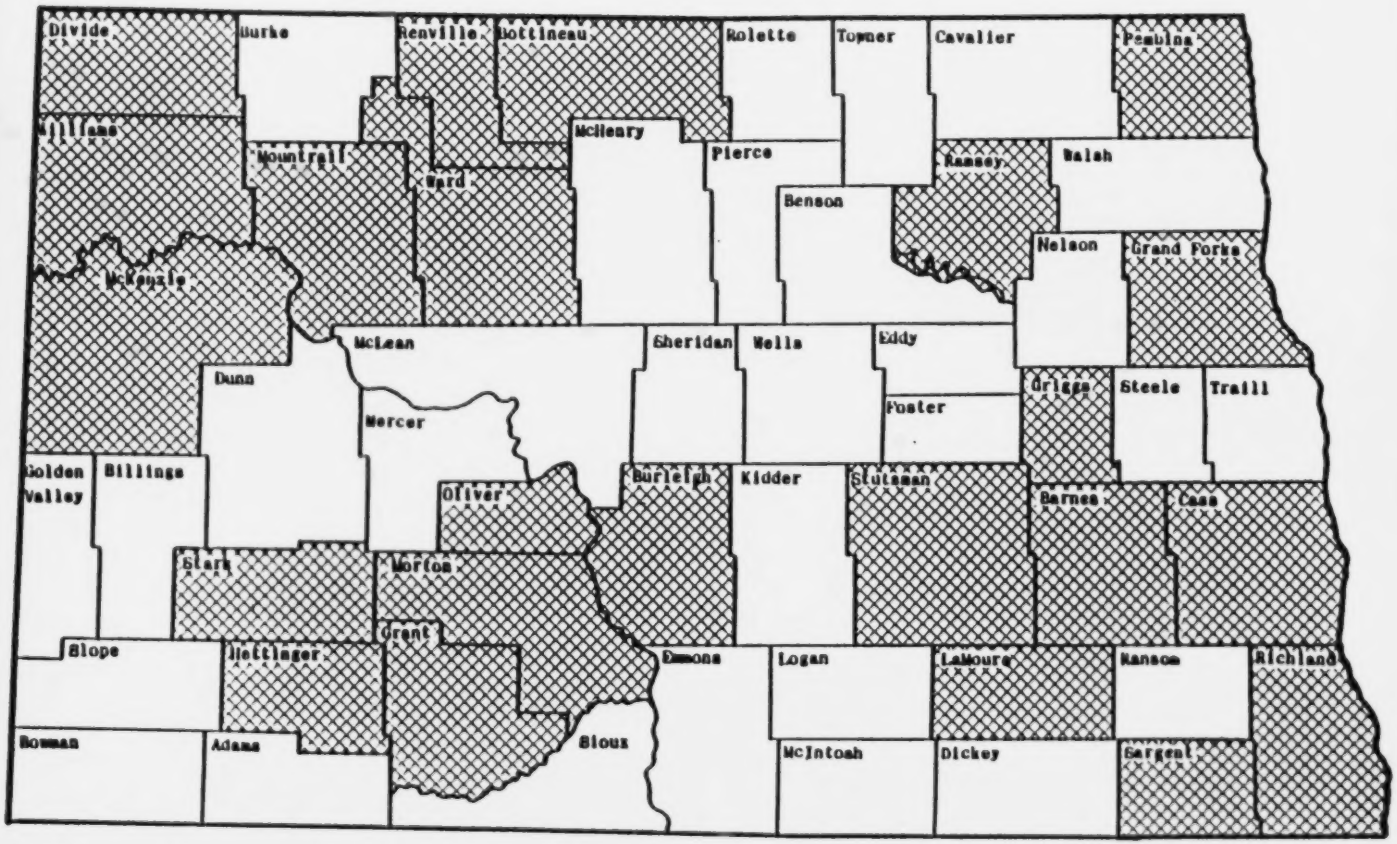
Public Understanding of Alzheimer's Disease

The amount of information available on SDAT has been increasing over the past several years. Support and information organizations have been formed while press and other media coverage have more widely publicized the existence of SDAT. Special government hearings on the subject as well as intensified research efforts by the medical community have expanded our knowledge base concerning SDAT. Nevertheless, misunderstandings and myths about the disease still remain.

Despite information available to the public and the medical community, there may be a reluctance to diagnose SDAT and to treat it as such. For example, the medical community has not always been consistent in the way it handles SDAT. This may be noted by the low number of deaths attributed to SDAT. It has been suggested that the reporting of SDAT may be artificially deflated in reaction to perceived discriminatory funding policies. Medicare, for example, does not fully reimburse SDAT patients because supplied services are viewed as custodial care. Whether death occurs as a direct result of SDAT or as a result of its complications and related accidents is an unresolved issue. What is apparent, however, is that the number of SDAT deaths reported in North Dakota varies greatly from county to county.

Greater care must be taken in the clinical diagnosis of the type of a patient's dementia. In most cases, custodial care may be all that is currently possible for patients with SDAT. Nevertheless, there are various forms of treatment for other types of dementia, such as the multi-infarct type. When the disease is correctly diagnosed, these may be beneficial to the patient.

As shown in Appendix Table 12 and on Figure 2, 1985 SDAT reported deaths were confined in three regions in the state: the northwest, the south central, and the east central regions. There is little research evidence available to suggest that there are regional differences in SDAT. Therefore, one should be cautious in interpreting the pattern implied by SDAT death statistics reported for the state. This is especially true given the small number (21) of reported SDAT deaths in 1985. The range in the estimated number of persons with SDAT in 1985 (Appendix Tables 3, 8, and 13) would lead one to expect a considerably higher number of deaths to be attributed to SDAT.



Counties reporting Alzheimer's Disease deaths between 1979 and 1985.

Figure 2. Reported Deaths Related to Alzheimer's Disease, 1979-1985

Need for Further Research

This report was based on a mathematical model used to project the number of persons with SDAT by projecting a base population and applying prevalence rates as multipliers. This method is a standard method in epidemiological projections and can be most useful in determining future trends based on current information and on the assumption that future trends will follow past ones. Nevertheless, a number of methodological issues must be called to the readers' attention. First, although the prevalence rates used in this report may not be totally reflective of the actual SDAT prevalence rates of North Dakota, they are the best currently available. The range of rates used in this report was based on data from a rural Swedish population and an urban Baltimore, Maryland, population. Whether these populations accurately reflect circumstances in North Dakota can be debated. Second, the assumption that past trends are a reflection of future trends may or may not hold true. It is possible that birth rates and migration rates may change. It is also possible that medical research will discover a way to control or even cure SDAT. In either case, the projections reported in this study will be affected.

Information pertaining to correlates of incidence, prevalence, and mortality of SDAT is needed. For example, are there regional differences in physicians' diagnoses of SDAT or are the differences in prevalence of SDAT actually due to differences inherent in the various regions? Are there factors other than age, such as gender, occupation, and environment, which relate to SDAT? What is the social and economic impact of an aging population (and an increasing SDAT population) on a county? This report is offered as a step to help us handle the emerging problem of SDAT. The next step to take if we are to effectively assist a growing number of persons with SDAT is to conduct further research, to provide advance planning, and to develop insightful policies.

APPENDIX

APPENDIX TABLE 1. STUDIES OF PREVALENCE RATES OF VARIOUS DEMENTIAS AMONG THE ELDERLY

Reference	Country	N (Age)	Sex	Percent by Severity				Percent by Age						Type of Study
				"Severe"	"Mild"	"Other or Unspecified"	Total	60-64	65-69	70-74	75-79	80-84	85+	
AD Research (1984) (from Adolfsson 1981)	Sweden	1,239 (65+)	total	---	---	---	---	---	1.3	2.8	7.2	13.2	23.7	AD
Akesson (1961)	rural Sweden	2,979 (65+)	total	1.3	---	---	---	---	---	---	---	---	---	SD
Akesson (1969)	rural Sweden	4,198 (65+)	total	---	---	---	1.0	---	---	---	---	---	---	SA
Aronson and Katz (1986)	Rhode Island	1,500 (60+)	total	---	---	---	---	---	1.5	4.5		17.5		AD
Bentson (1970)	Norway	942 (60+)	total	5.3	---	---	5.3	---	---	---	---	---	---	SA
Bollerup (1975)	Denmark	626 (70+)	total	3.2	---	1.8	5.0	---	---	---	---	---	---	SA
Bremer (1951)	Norway	119 (60+)	total	2.5	---	---	---	---	---	---	---	---	---	SA
Broe et al. (1976)	Scotland	808 (65+)	females	---	---	---	---	---	4.2		14.7			SD
			males	---	---	---	---	---	4.5		12.9			
			total	3.8	4.3	---	---	---	4.3		14.0			
Essen-Moller et al. (1956)	Sweden	443 (60+)	females	3.9	7.9	---	---	---	---	---	---	---	---	SD
			males	6.1	14.5	---	---	---	---	---	---	---	---	
			total	5.0	10.8	---	15.8	---	---	---	---	---	---	
Gruenberg (1961) (in Kay 1972)	USA	1,592 (65+)	total	6.8	---	---	---	---	---	---	---	---	---	CBS
Gurland (1980)	New York City	443 (65+)	females	---	---	---	---	---	4.0	3.3		11.3		AD
			males	---	---	---	---	---	2.0	0.0		6.3		
			total	3.9	---	---	---	---	3.1	1.2		9.5		
Hagnell (1970) (in Kay 1972)	Lundby, Sweden	441 (60+)	total	9.1	7.2	---	---	---	---	---	---	---	---	CBS
Helgason (1973)	Iceland	2,642 (74-76)	total	3.6	---	1.4	5.0	---	---	---	---	---	---	SA

- continued -

APPENDIX TABLE 1. STUDIES OF PREVALENCE RATES OF VARIOUS DEMENTIAS AMONG THE ELDERLY (CONTINUED)

Reference	Country	N (Age)	Sex	Percent by Severity				Percent by Age						Type of Study
				"Severe"	"Mild"	"Other or Unspecified"	Total	60-64	65-69	70-74	75-79	80-84	85+	
Jensen (1963)	Denmark	546 (65+)	total	1.1	7.1	1.1	---	---	---	---	---	---	---	SA
Kaneko (1967) (in Kay 1972)	Japan	531 (65+)	total	7.2	---	---	---	---	---	---	---	---	---	CBS
Kay et al. (1964)	England	505 (65+)	total	5.6	5.7	---	---	---	---	---	---	---	---	OBS
Kay et al. (1970)	England	758 (65+)	females	---	---	---	---	---	1.4	2.6	5.4	22.8		SD
			males	---	---	---	---	---	3.6	3.3	5.9	20.5		
			total	6.2	2.6	---	8.8	---	2.4	2.9	5.6	22.0		
Lin (1953)	China	1,113 (60+)	total	---	---	---	0.5	---	---	---	---	---	---	SD
Nielsen (1962)	Denmark	978 (65+)	females	3.3	17.7	---	---	---	1.7	14.8	37.9	41.3	66.7	SD
			males	2.9	13.2	---	---	---	6.3	12.4	15.0	49.5	56.2	
			total	3.1	15.4	---	---	---	4.2	13.7	26.0	45.0	60.7	
Parsons (1965)	England	228 (65+)	total	4.4	10.0	---	14.0	---	---	---	---	---	---	SD
Pfeiffer (1975)	North Carolina	925 (65+)	total	7.1	24.7	---	31.8	---	---	---	---	---	---	SD
Primrose (1962)	Scotland	222 (74-76)	total	---	---	---	4.5	---	---	---	---	---	---	SD
Roth (1978)	England	771 (nr)	total	---	---	---	---	---	2.3	3.9		22.0		SD
	Japan	nr (nr)	total	---	---	---	---	---	2.3	5.9		19.8		SD
Sayetta (1986)	Baltimore, Maryland	518 (60+)	total	---	---	---	---	0.2	1.0	2.6	5.7	11.6	33.1	AD
Sheldon (1948)	England	369 (65+)	total	3.9	11.7	---	15.6	---	---	---	---	---	---	PS
Wang (1969)	USA	Nation (65+)	total	2.3	---	---	---	---	---	---	---	---	---	SD

AD = Alzheimer's disease; CBS = chronic brain syndrome; PS = "psychiatric syndromes of old age"; SA = senile and arteriosclerotic psychosis; SD = senile dementia; nr = not reported; OBS = organic brain syndrome.

APPENDIX TABLE 2. LOW-SERIES ESTIMATED NUMBER OF PERSONS WITH ALZHEIMER'S DISEASE IN NORTH DAKOTA BY GENDER, AGE, AND COUNTY, 1980

County	Males						Females						Total
	60-64	65-69	70-74	75-79	80-84	85+	60-64	65-69	70-74	75-79	80-84	85+	
Adams	0	1	2	3	3	4	0	1	2	4	4	11	35
Barnes	1	3	8	11	15	20	1	4	9	14	22	45	151
Benson	0	2	5	6	7	9	0	2	4	7	8	13	54
Billings	0	0	1	0	0	0	0	0	0	0	0	0	2
Bottineau	1	3	6	8	8	15	1	3	6	9	12	20	91
Bowman	0	1	2	2	3	4	0	1	2	3	5	6	29
Burke	0	1	3	4	5	5	0	1	3	4	5	8	38
Burleigh	2	7	14	19	21	34	2	9	19	29	41	60	257
Cass	3	11	23	35	46	61	3	15	31	56	87	150	523
Cavalier	0	2	4	7	8	12	0	2	4	8	11	18	77
Dickey	0	2	4	6	7	13	0	2	4	7	10	26	83
Divide	0	1	2	3	4	5	0	1	2	3	5	9	36
Dunn	0	1	2	3	3	2	0	1	2	2	3	3	23
Eddy	0	1	2	4	6	5	0	1	3	5	5	12	45
Emmons	0	1	3	5	5	11	0	1	3	5	7	9	53
Foster	0	1	2	4	5	9	0	1	3	4	6	10	47
G Valley	0	1	1	2	2	2	0	1	1	3	3	6	21
G Forks	2	7	14	22	29	47	2	9	20	37	52	92	333
Grant	0	1	2	3	2	3	0	1	3	3	4	2	25
Griggs	0	1	2	4	5	7	0	1	2	4	5	11	43
Hettinger	0	1	3	3	3	6	0	1	2	3	5	6	34
Kidder	0	1	2	3	3	2	0	1	2	3	4	7	27
LaMoure	0	2	4	5	9	12	0	2	4	6	9	16	69
Logan	0	1	2	4	2	3	0	1	2	4	3	3	25
McHenry	0	3	5	7	8	12	0	2	5	9	11	8	71
McIntosh	0	1	3	6	8	8	0	2	4	8	8	13	62
McKenzie	0	2	3	3	2	11	0	1	2	3	4	10	42
McLean	1	3	7	8	9	17	1	3	6	8	11	19	93
Mercer	0	2	3	4	4	6	0	2	3	6	6	15	52
Morton	1	4	8	12	14	21	1	5	11	19	26	36	157
Mountrail	0	2	4	5	7	10	0	2	4	6	10	16	67
Nelson	0	2	3	6	10	17	0	2	4	7	14	21	85
Oliver	0	0	1	1	1	2	0	0	1	1	1	0	9
Pembina	1	2	5	9	12	23	1	3	6	12	15	25	112
Pierce	0	2	4	5	6	9	0	2	4	6	9	18	65
Ramsey	1	3	6	10	14	18	1	3	8	13	20	30	127
Ransom	0	2	4	7	9	12	0	2	4	8	13	18	79
Renville	0	1	3	3	2	6	0	1	3	3	3	8	34
Richland	1	3	9	13	21	24	1	4	10	18	27	52	182
Rolette	0	2	4	6	5	5	0	2	4	7	8	9	53
Sargent	0	1	3	5	5	8	0	1	3	5	6	10	48
Sheridan	0	1	1	3	3	5	0	1	2	2	3	5	26
Sioux	0	0	1	1	0	1	0	0	1	1	3	2	11
Slope	0	0	0	1	0	1	0	0	0	1	1	1	6
Stark	1	4	7	12	9	15	1	4	9	14	18	28	122
Steele	0	1	2	3	3	5	0	1	2	3	4	6	29
Stutsman	1	5	10	14	21	22	1	6	12	22	30	45	189
Towner	0	1	3	4	5	5	0	1	3	5	7	10	46
Traill	1	3	5	9	11	19	1	3	6	12	19	31	120
Walsh	1	4	8	11	18	26	1	4	9	16	22	38	158
Ward	2	8	17	23	26	36	2	10	21	30	40	72	287
Wells	0	2	5	8	8	11	0	2	5	9	11	13	76
Williams	1	5	6	10	13	17	1	4	9	15	18	31	130
State	28	124	251	377	454	658	29	137	298	492	687	1,133	4,670

Note: Due to rounding, the numbers listed in the "Total" column and the "State " row may not be exactly equal to their respective sums of AD cases by age and sex.

APPENDIX TABLE 3. LOW-SERIES ESTIMATED NUMBER OF PERSONS WITH ALZHEIMER'S DISEASE IN NORTH DAKOTA BY GENDER, AGE, AND COUNTY, 1985

County	Males						Females						Total
	60-64	65-69	70-74	75-79	80-84	85+	60-64	65-69	70-74	75-79	80-85	85+	
Adams	0	1	2	4	5	6	0	1	2	4	6	6	37
Barnes	1	3	8	14	18	24	1	4	9	19	26	48	174
Benson	0	2	4	7	9	11	0	2	4	8	10	15	73
Billings	0	0	0	1	0	0	0	0	0	0	0	0	3
Bottineau	0	2	6	10	12	9	1	2	6	12	17	30	108
Bowman	0	1	2	4	5	5	0	1	2	5	6	9	42
Burke	0	1	3	4	4	8	0	1	3	4	5	13	48
Burleigh	2	8	16	23	28	34	3	10	21	40	58	98	341
Cass	3	14	24	40	52	74	4	15	35	61	98	187	608
Cavalier	0	2	5	7	12	9	0	2	5	8	13	24	87
Dickey	0	2	4	7	13	11	0	2	5	9	13	23	89
Divide	0	1	3	4	3	8	0	1	3	4	4	15	47
Dunn	0	1	2	2	3	3	0	1	2	3	3	7	29
Eddy	0	1	3	4	6	10	0	1	2	5	8	9	51
Emmons	0	1	3	5	8	8	0	1	3	6	8	15	60
Foster	0	1	2	5	7	11	0	1	3	6	8	15	60
G Valley	0	1	1	1	3	3	0	1	2	1	4	8	25
G Forks	2	8	14	24	34	40	2	8	22	41	69	104	368
Grant	0	1	3	4	5	2	0	1	3	5	5	7	35
Griggs	0	1	3	3	5	6	0	1	3	4	6	11	44
Hettinger	0	1	3	4	5	5	0	1	3	4	6	10	42
Kidder	0	1	2	3	3	5	0	1	2	4	5	7	35
LaMoure	0	2	4	6	7	18	0	2	5	8	10	21	83
Logan	0	1	2	4	6	1	0	1	3	4	8	5	34
McHenry	0	2	6	7	12	11	1	2	5	10	17	17	90
McIntosh	0	2	3	7	9	15	0	2	4	8	14	18	83
McKenzie	0	1	4	4	3	3	0	1	3	4	4	7	36
McLean	1	3	7	11	11	14	1	3	8	13	13	19	105
Mercer	1	2	4	5	7	5	0	2	5	6	10	11	58
Morton	1	4	9	12	15	19	1	5	12	23	36	53	192
Mountrail	0	2	5	6	7	12	0	2	4	8	12	24	84
Nelson	0	2	4	6	10	19	0	2	4	7	13	33	101
Oliver	0	0	1	1	2	1	0	0	1	1	1	1	10
Pembina	1	2	6	9	14	20	1	3	6	11	22	34	128
Pierce	0	1	3	7	7	10	0	1	5	8	11	22	77
Ramsey	1	3	7	11	15	22	1	3	9	16	24	45	157
Ransom	0	2	4	7	11	11	0	2	4	7	13	30	92
Renville	0	1	2	4	5	5	0	1	2	5	6	9	40
Richland	1	4	8	16	18	35	1	4	11	20	28	55	201
Rolette	1	2	5	8	8	7	1	2	5	9	12	17	77
Sargent	0	1	2	4	7	6	0	1	3	6	7	14	53
Sheridan	0	1	2	2	3	3	0	1	1	3	3	5	24
Sioux	0	0	1	1	1	1	0	1	1	1	1	7	14
Slope	0	0	0	0	1	0	0	0	0	1	1	3	7
Stark	1	4	9	15	21	14	1	5	10	19	25	43	169
Steele	0	1	1	3	3	4	0	1	2	3	5	7	29
Stutsman	1	4	9	15	19	32	1	5	12	21	39	55	212
Towner	0	1	2	5	6	8	0	1	3	7	8	17	59
Traill	0	2	6	9	14	18	1	3	6	13	24	44	141
Walsh	1	4	8	12	15	29	1	4	9	18	28	51	180
Ward	2	8	17	32	33	46	2	9	26	41	56	87	350
Wells	0	2	5	9	12	15	0	2	5	11	16	24	102
Williams	1	4	10	10	15	19	1	4	11	16	31	38	161
State	28	123	272	429	564	716	29	133	325	586	877	1,480	5,564

Note: Due to rounding, the numbers listed in the "Total" column and the "State " row may not be exactly equal to their respective sums of AD cases by age and sex.

APPENDIX TABLE 4. LOW-SERIES ESTIMATED NUMBER OF PERSONS WITH ALZHEIMER'S DISEASE IN NORTH DAKOTA BY GENDER, AGE, AND COUNTY, 1990

County	Males						Females						Total
	60-64	65-69	70-74	75-79	80-84	85+	60-64	65-69	70-74	75-79	80-85	85+	
Adams	0	1	2	4	7	8	0	1	2	4	7	11	46
Barnes	1	4	8	14	24	30	1	3	9	19	35	56	203
Benson	0	2	4	7	11	13	0	2	4	7	12	19	80
Billings	0	0	1	1	0	0	0	0	0	0	0	0	3
Bottineau	0	2	5	11	14	13	0	2	6	12	22	42	130
Bowman	0	1	2	4	8	9	0	1	2	6	10	13	56
Burke	0	1	2	4	4	8	0	1	3	5	6	14	49
Burleigh	3	9	19	27	34	46	3	13	23	43	78	138	435
Cass	4	16	29	41	60	83	4	16	36	68	108	211	675
Cavalier	0	2	4	8	11	15	0	2	5	9	13	29	97
Dickey	0	2	5	7	14	20	0	2	5	10	15	28	108
Divide	0	1	3	4	4	7	0	1	3	5	5	14	47
Dunn	0	1	2	3	3	4	0	1	2	3	5	6	30
Eddy	0	1	2	5	6	11	0	1	3	5	9	15	58
Emmons	0	1	3	5	7	13	0	2	3	5	9	17	66
Foster	0	1	2	5	8	14	0	1	3	7	11	19	71
G Valley	0	1	1	2	2	3	0	1	2	3	2	10	28
G Forks	2	8	16	24	37	48	2	9	20	45	75	138	423
Grant	0	1	2	5	5	6	0	1	2	5	8	8	43
Griggs	0	1	2	4	5	6	0	1	2	5	7	12	46
Hettinger	0	1	2	4	6	8	0	1	3	6	8	11	52
Kidder	0	1	2	3	4	5	0	1	2	4	7	10	40
LaMoure	0	2	4	6	8	15	0	1	4	10	13	25	88
Logan	0	1	2	2	6	4	0	1	2	4	8	15	46
McHenry	0	2	4	9	12	16	0	2	4	10	19	28	106
McIntosh	0	2	4	7	11	17	0	1	4	8	15	30	101
McKenzie	0	1	3	6	5	5	0	1	3	5	6	7	43
McLean	1	3	7	12	15	18	1	3	8	17	21	23	129
Mercer	1	3	5	7	7	11	1	2	6	10	10	17	79
Morton	2	5	9	15	16	21	1	5	14	27	45	72	231
Mountrail	0	2	4	9	10	13	0	2	5	9	16	30	99
Nelson	0	2	4	8	10	20	0	2	4	9	14	29	102
Oliver	0	0	1	1	1	2	0	0	1	1	1	2	11
Pembina	1	2	5	10	15	24	1	3	6	12	21	49	149
Pierce	0	1	3	6	9	12	0	1	3	9	15	27	88
Ramsey	1	3	7	12	17	24	1	3	8	19	30	55	179
Ransom	0	2	4	7	11	15	0	1	4	7	12	30	94
Renville	0	1	1	3	6	10	0	1	1	5	8	15	53
Richland	1	4	9	15	21	31	1	4	10	21	33	58	208
Rolette	1	3	5	9	11	13	1	3	6	10	16	26	103
Sargent	0	1	2	4	6	10	0	1	2	6	9	16	58
Sheridan	0	1	1	2	2	4	0	1	1	2	5	6	25
Sioux	0	0	1	1	1	2	0	0	1	1	2	3	13
Slope	0	0	1	0	1	1	0	0	0	1	1	2	6
Stark	1	4	10	20	27	32	1	5	12	22	34	59	228
Steele	0	1	2	2	3	3	0	1	2	2	4	8	28
Stutsman	1	4	8	14	20	30	1	4	10	20	36	69	219
Towner	0	1	2	4	8	9	0	1	2	6	12	19	65
Traill	1	2	5	11	14	23	0	3	7	13	25	57	160
Walsh	1	3	8	12	17	24	1	4	10	18	32	63	192
Ward	1	7	17	31	46	58	2	8	22	50	78	121	441
Wells	0	2	4	10	14	23	0	2	5	11	18	34	123
Williams	1	4	9	17	16	22	1	4	10	20	33	65	202
State	28	124	272	463	642	880	29	133	317	640	1,044	1,883	6,454

Note: Due to rounding, the numbers listed in the "Total" column and the "State " row may not be exactly equal to their respective sums of AD cases by age and sex.

APPENDIX TABLE 5. LOW-SERIES ESTIMATED NUMBER OF PERSONS WITH ALZHEIMER'S DISEASE IN NORTH DAKOTA BY GENDER, AGE, AND COUNTY, 1995

County	Males						Females						Total
	60-64	65-69	70-74	75-79	80-84	85+	60-64	65-69	70-74	75-79	80-85	85+	
Adams	0	1	1	3	7	11	0	1	2	5	6	12	49
Barnes	1	3	8	14	24	39	1	3	8	19	34	77	230
Benson	0	1	4	7	10	16	0	2	4	7	11	21	83
Billings	0	0	0	1	0	0	0	0	0	0	0	0	3
Bottineau	0	2	4	10	15	15	0	2	6	12	22	53	141
Bowman	0	1	2	3	8	15	0	1	2	5	11	21	69
Burke	0	1	2	3	4	8	0	1	2	5	7	16	49
Burleigh	3	12	22	33	40	54	3	15	31	48	84	185	530
Cass	4	17	33	50	61	95	4	18	39	71	119	231	742
Cavalier	0	2	4	6	13	13	0	2	4	9	14	30	97
Dickey	0	2	4	10	13	22	0	1	4	10	18	33	118
Divide	0	1	2	4	5	9	0	1	2	5	7	16	52
Dunn	0	1	2	2	4	3	0	1	2	4	5	10	33
Eddy	0	1	2	4	8	11	0	1	2	6	8	17	60
Emmons	0	1	3	4	7	12	0	1	3	5	8	18	65
Foster	0	1	2	4	8	16	0	1	3	7	13	28	84
G Valley	0	1	1	2	3	3	0	1	1	3	5	5	25
G Forks	1	7	17	27	37	52	1	8	21	41	83	150	445
Grant	0	1	2	3	7	7	0	1	2	4	8	14	48
Griggs	0	1	2	3	6	6	0	1	3	4	8	14	48
Hettinger	0	1	3	4	7	10	0	1	3	5	11	15	60
Kidder	0	1	2	4	4	6	0	1	3	4	8	13	45
LaMoure	0	1	3	6	9	16	0	1	4	7	16	32	95
Logan	0	1	2	3	4	4	0	1	2	3	9	14	45
McHenry	0	2	3	6	15	16	0	2	4	7	19	31	106
McIntosh	0	2	4	8	11	21	0	2	3	8	16	33	107
McKenzie	0	1	3	5	6	6	0	1	3	6	8	10	50
McLean	1	3	7	12	17	25	1	2	7	17	27	36	154
Mercer	1	4	7	8	11	11	1	3	6	11	17	19	97
Morton	1	7	10	15	18	22	1	6	14	30	52	90	267
Mountrail	0	1	3	7	13	18	0	1	4	10	17	40	115
Nelson	0	2	4	7	13	20	0	2	5	8	16	31	109
Oliver	0	0	1	1	1	1	0	0	1	1	1	3	11
Pembina	0	2	5	10	17	25	0	3	6	12	22	47	151
Pierce	0	1	3	6	8	17	0	1	4	7	16	37	101
Ramsey	1	3	8	13	18	27	1	3	8	17	34	67	199
Ransom	0	2	5	7	11	13	0	2	3	7	12	28	92
Renville	0	1	1	2	5	13	0	1	2	3	9	23	58
Richland	1	4	10	16	21	37	1	4	9	19	34	68	222
Rolette	1	3	6	10	12	18	1	3	6	12	17	34	122
Sargent	0	1	2	4	6	8	0	1	2	5	9	19	58
Sheridan	0	1	1	2	2	2	0	1	1	2	3	8	24
Sioux	0	0	1	1	1	2	0	0	1	1	1	4	14
Slope	0	0	0	1	1	0	0	0	0	1	1	2	5
Stark	1	6	11	22	35	41	1	6	13	24	39	80	280
Steele	0	1	1	3	3	4	0	1	2	3	4	7	26
Stutsman	1	5	8	13	19	31	1	5	8	17	35	64	207
Towner	0	1	2	4	6	12	0	1	2	5	10	27	70
Traill	0	2	5	10	16	22	0	2	6	14	25	58	162
Walsh	1	3	6	12	16	26	1	3	8	21	32	74	203
Ward	1	6	14	32	46	81	1	7	20	44	94	169	515
Wells	0	2	4	8	15	25	0	2	4	10	19	40	129
Williams	1	4	8	15	25	23	1	4	10	19	40	70	220
State	26	126	273	466	694	1,010	27	134	317	626	1,142	2,248	7,090

Note: Due to rounding, the numbers listed in the "Total" column and the "State" row may not be exactly equal to their respective sums of AD cases by age and sex.

APPENDIX TABLE 6. LOW-SERIES ESTIMATED NUMBER OF PERSONS WITH ALZHEIMER'S DISEASE IN NORTH DAKOTA BY GENDER, AGE, AND COUNTY, 2000

County	Males						Females						Total
	60-64	65-69	70-74	75-79	80-84	85+	60-64	65-69	70-74	75-79	80-85	85+	
Adams	0	0	2	2	6	12	0	1	2	4	8	11	47
Barnes	1	3	7	15	24	39	1	3	7	16	35	75	224
Benson	0	1	3	6	11	15	0	1	4	6	10	19	77
Billings	0	0	0	0	0	0	0	0	0	0	0	0	2
Bottineau	0	1	4	8	13	16	0	2	5	12	21	53	136
Bowman	0	1	2	3	6	14	0	1	2	5	10	23	68
Burke	0	1	2	2	3	8	0	1	2	4	7	18	48
Burleigh	3	13	29	37	48	65	4	17	35	63	95	200	609
Cass	4	17	35	58	74	97	4	18	43	77	124	255	806
Cavalier	0	2	4	6	10	15	0	2	4	8	14	32	97
Dickey	0	1	3	7	19	21	0	1	4	8	18	41	124
Divide	0	0	1	4	5	10	0	1	2	3	7	20	53
Dunn	0	1	1	2	3	4	0	1	1	3	5	10	31
Eddy	0	1	2	4	6	13	0	1	2	4	10	16	59
Emmons	0	1	3	4	6	12	0	1	3	6	8	17	62
Foster	0	1	2	5	8	17	0	1	3	6	12	33	87
G Valley	0	0	1	2	3	4	0	0	1	2	4	12	31
G Forks	1	4	14	28	42	52	1	6	19	44	76	187	454
Grant	0	1	1	3	4	8	0	1	2	4	6	14	43
Griggs	0	1	2	3	5	7	0	1	2	5	6	16	48
Hettinger	0	1	2	4	6	11	0	1	2	5	9	22	63
Kidder	0	1	2	3	5	6	0	1	2	5	7	15	45
LaMoure	0	1	3	5	8	18	0	1	3	7	12	39	97
Logan	0	1	2	3	5	3	0	1	2	3	7	18	45
McHenry	0	1	4	5	10	21	0	1	3	8	14	31	99
McIntosh	0	1	4	9	12	21	0	1	4	6	15	33	107
McKenzie	0	1	2	4	6	9	0	1	3	5	9	14	55
McLean	1	3	7	12	17	27	1	2	6	14	28	46	163
Mercer	2	5	9	10	13	16	1	4	8	11	18	30	127
Morton	2	6	15	16	19	28	1	7	17	31	57	104	300
Mountrail	0	1	3	6	11	23	0	1	3	9	20	41	118
Nelson	0	1	4	7	11	25	0	1	6	10	15	37	119
Oliver	0	1	1	1	1	1	0	0	1	1	1	3	10
Pembina	0	2	5	9	17	29	0	2	6	12	22	50	154
Pierce	0	1	3	6	8	15	0	1	4	7	12	40	97
Ramsey	1	3	8	14	19	29	1	3	8	18	31	76	210
Ransom	0	1	4	9	12	15	0	1	3	6	12	28	91
Renville	0	1	1	2	3	4	0	1	1	3	5	21	48
Richland	1	3	9	17	22	35	1	4	10	18	31	71	221
Rolette	1	3	6	11	14	19	0	3	6	13	22	37	136
Sargent	0	1	2	4	6	7	0	1	2	5	8	20	56
Sheridan	0	1	1	2	2	2	0	1	1	2	4	6	21
Sioux	0	1	1	1	1	2	0	0	1	1	2	3	14
Slope	0	0	0	0	1	0	0	0	0	1	1	1	5
Stark	2	6	15	23	38	53	1	7	16	28	43	90	322
Steele	0	0	1	2	3	3	0	1	1	3	4	6	24
Stutsman	1	4	9	13	17	30	1	5	11	14	29	63	196
Towner	0	1	1	4	7	9	0	1	2	5	8	22	60
Traill	0	2	5	9	15	26	0	2	5	13	27	59	163
Walsh	1	3	6	10	16	25	1	3	8	17	37	74	200
Ward	1	4	13	26	46	80	1	6	18	40	82	204	520
Wells	0	1	4	7	12	28	0	1	4	8	17	41	125
Williams	1	3	9	14	22	37	1	3	10	18	39	85	243
State	28	114	279	469	699	1,091	27	126	320	628	1,119	2,458	7,360

Note: Due to rounding, the numbers listed in the "Total" column and the "State" row may not be exactly equal to their respective sums of AD cases by age and sex.

APPENDIX TABLE 7. HIGH-SERIES ESTIMATED NUMBER OF PERSONS WITH ALZHEIMER'S DISEASE IN NORTH DAKOTA BY GENDER, AGE, AND COUNTY, 1980

County	Males						Females						Total
	60-64	65-69	70-74	75-79	80-84	85+	60-64	65-69	70-74	75-79	80-85	85+	
Adams	1	1	2	3	4	5	1	1	2	5	4	13	44
Barnes	5	4	8	14	17	23	5	5	10	18	25	93	187
Benson	3	2	5	8	8	10	2	2	5	8	9	16	79
Billings	1	0	1	0	0	0	0	0	0	0	0	0	3
Bottineau	3	3	6	11	10	18	3	3	6	12	14	23	113
Bowman	1	1	2	3	4	4	1	1	2	4	5	7	36
Burke	1	2	3	5	5	5	2	2	3	5	6	9	47
Burleigh	11	9	15	24	24	40	12	11	21	37	47	71	323
Cass	19	15	25	44	53	72	21	19	34	71	100	177	650
Cavalier	3	3	5	9	9	14	3	3	5	10	12	21	96
Dickey	3	2	4	8	8	15	3	3	4	9	12	31	102
Divide	2	2	3	4	4	6	2	2	2	4	6	10	46
Dunn	2	2	2	3	3	3	2	1	2	3	4	4	30
Eddy	1	1	2	5	7	6	2	1	3	6	6	14	55
Emmons	2	2	3	6	6	13	2	2	4	7	8	11	66
Foster	1	1	2	5	6	11	2	2	3	5	7	12	58
G Valley	1	1	1	2	3	2	1	1	1	4	4	7	27
G Forks	12	9	15	28	33	55	12	12	21	47	59	109	413
Grant	1	2	3	4	2	4	2	2	3	4	4	2	32
Griggs	2	2	2	5	6	8	1	2	3	5	6	13	54
Hettinger	2	2	3	4	3	7	2	2	3	4	6	7	41
Kidder	2	1	2	4	4	2	1	1	2	4	4	8	35
LaMoure	2	2	4	6	10	14	2	3	5	8	10	19	85
Logan	2	1	3	5	3	4	1	1	2	5	3	4	33
McHenry	3	4	5	9	9	14	3	3	6	11	12	10	89
McIntosh	2	2	4	8	9	9	2	2	5	10	10	15	77
McKenzie	2	2	3	4	2	13	2	2	2	4	5	12	53
McLean	4	4	7	11	10	20	4	4	7	10	13	22	118
Mercer	3	2	3	5	4	7	3	3	4	7	7	17	65
Morton	6	5	8	15	16	25	6	6	12	24	30	43	196
Mountrail	3	3	4	6	8	12	3	2	4	8	11	19	83
Nelson	2	2	4	8	11	20	2	2	4	9	16	24	104
Oliver	1	1	1	2	1	2	1	1	1	1	1	0	11
Pembina	4	3	5	11	13	27	4	4	6	15	17	30	138
Pierce	2	2	4	7	6	10	2	2	5	8	10	21	80
Ramsey	4	4	7	13	16	21	4	4	8	17	23	36	156
Ransom	3	2	4	9	10	14	2	2	4	10	15	22	98
Renville	1	1	3	4	3	7	1	1	3	4	4	9	42
Richland	5	5	9	17	23	29	5	6	11	22	31	61	224
Rolette	3	3	5	8	5	6	3	3	5	9	9	11	67
Sargent	2	2	3	6	6	9	2	2	3	6	7	12	59
Sheridan	1	1	2	4	3	5	1	1	2	3	3	5	32
Sioux	1	0	1	1	0	1	1	0	1	1	1	3	14
Slope	1	0	1	1	0	1	0	0	1	1	2	1	9
Stark	5	5	8	15	11	18	6	5	10	18	21	33	155
Steele	1	1	2	3	4	5	1	1	2	4	5	7	37
Stutsman	7	6	10	18	23	25	7	7	13	28	35	54	224
Towner	2	1	3	5	6	6	1	2	3	6	8	12	57
Traill	3	3	6	12	13	22	4	3	7	16	21	37	147
Walsh	5	5	9	14	21	31	6	5	10	20	26	45	196
Ward	12	10	19	29	30	43	13	13	23	38	46	85	359
Wells	2	3	5	10	9	13	3	3	6	12	12	16	94
Williams	6	6	7	13	15	20	6	6	9	19	20	37	164
State	178	160	272	478	518	778	185	177	322	624	783	1,339	5,814

Note: Due to rounding, the numbers listed in the "Total" column and the "State " row may not be exactly equal to their respective sums of AD cases by age and sex.

APPENDIX TABLE B. HIGH-SERIES ESTIMATED NUMBER OF PERSONS WITH ALZHEIMER'S DISEASE IN NORTH DAKOTA BY GENDER, AGE, AND COUNTY, 1985

County	Males						Females						Total
	60-64	65-69	70-74	75-79	80-84	85+	60-64	65-69	70-74	75-79	80-85	85+	
Adams	1	1	2	5	5	7	1	1	2	5	7	8	46
Barnes	5	4	8	18	21	28	4	5	10	24	29	56	214
Benson	2	3	5	9	10	13	2	2	4	10	11	18	90
Billings	0	0	1	1	0	0	0	0	0	1	0	0	4
Bottineau	3	3	7	13	13	11	3	3	6	15	20	35	132
Bowman	1	1	2	5	6	6	1	1	3	7	7	11	51
Burke	1	1	3	5	5	10	1	2	3	5	6	16	59
Burleigh	13	10	18	29	32	41	16	12	22	50	66	116	426
Cass	22	18	28	51	59	87	23	20	37	78	112	222	754
Cavalier	2	2	5	8	14	11	2	3	5	11	14	29	107
Dickey	2	3	4	9	14	13	2	3	5	11	14	27	108
Divide	2	2	3	5	4	10	1	2	3	5	5	18	58
Dunn	2	1	2	3	4	4	1	1	2	4	4	8	36
Eddy	1	1	3	5	7	12	1	2	3	6	9	11	62
Emmons	2	2	3	6	9	10	2	2	4	7	9	18	74
Foster	2	1	3	6	8	13	1	1	3	8	9	18	73
G Valley	1	1	1	2	3	3	1	1	1	2	2	5	10	31
G Forks	12	10	16	30	39	48	13	11	23	51	79	122	455
Grant	2	1	3	5	5	2	1	1	3	7	5	8	44
Griggs	2	1	3	4	6	7	2	1	3	6	7	13	55
Hettinger	2	1	3	5	6	6	2	2	4	5	6	12	53
Kidder	1	2	2	4	4	6	2	1	2	5	6	9	43
LaMoure	2	2	4	7	8	21	2	2	6	10	12	25	101
Logan	2	1	2	5	7	2	1	1	3	5	9	6	43
McHenry	2	2	7	9	13	13	3	2	6	12	20	20	111
McIntosh	2	2	4	9	10	18	2	2	5	10	16	21	102
McKenzie	2	2	4	5	4	3	2	2	3	5	5	9	45
McLean	4	4	8	14	13	17	4	4	9	17	15	23	131
Mercer	3	3	5	6	8	6	3	3	6	8	11	13	74
Morton	7	6	10	16	17	23	7	7	13	29	41	63	237
Mountrail	2	2	6	8	8	14	3	3	4	11	14	29	104
Nelson	2	2	5	8	12	22	3	2	5	9	14	39	122
Oliver	1	1	1	1	2	1	1	1	1	2	1	2	12
Pembina	3	3	6	11	16	23	4	3	7	14	25	40	157
Pierce	2	2	4	9	8	12	2	2	5	11	12	26	94
Ramsey	5	4	7	14	17	28	5	4	9	21	28	54	193
Ransom	3	2	5	8	13	14	2	2	4	9	15	35	113
Renville	1	1	2	5	6	6	1	1	3	6	6	11	49
Richland	6	5	9	20	21	41	5	5	12	26	32	66	247
Rolette	3	3	5	10	10	8	3	3	5	11	14	20	96
Sargent	2	2	3	6	9	8	2	1	3	7	9	16	66
Sheridan	1	1	2	2	4	3	1	1	1	4	4	6	30
Sioux	1	1	1	1	1	1	1	1	1	2	1	8	19
Slope	0	0	1	1	1	0	0	0	0	1	1	3	9
Stark	6	5	10	19	24	17	7	6	11	24	29	51	210
Steele	1	1	2	4	3	4	1	1	2	3	5	9	36
Stutsman	7	6	10	19	22	38	6	6	13	26	44	64	261
Towner	2	2	2	7	7	9	2	1	3	9	9	20	72
Traill	3	3	7	12	16	22	3	4	7	16	25	52	171
Walsh	4	5	8	15	17	34	5	6	10	23	32	61	220
Ward	10	10	18	40	38	54	12	11	28	53	63	103	441
Wells	2	2	6	11	14	18	2	3	6	14	18	28	124
Williams	6	5	11	13	17	22	6	5	11	20	35	45	196
State	178	160	294	543	643	846	185	172	352	742	1,000	1,749	6,862

Note: Due to rounding, the numbers listed in the "Total" column and the "State" row may not be exactly equal to their respective sums of AD cases by age and sex.

APPENDIX TABLE 9. HIGH-SERIES ESTIMATED NUMBER OF PERSONS WITH ALZHEIMER'S DISEASE IN NORTH DAKOTA BY GENDER, AGE, AND COUNTY, 1990

County	Males						Females						Total
	60-64	65-69	70-74	75-79	80-84	85+	60-64	65-69	70-74	75-79	80-85	85+	
Adams	1	1	2	5	8	9	1	1	3	5	7	13	56
Barnes	4	5	8	18	27	35	4	4	10	24	40	66	246
Benson	2	2	5	9	13	16	2	2	4	9	13	22	98
Billings	0	0	1	1	0	0	0	0	0	1	0	0	4
Bottineau	2	2	6	14	16	15	3	3	6	15	25	49	157
Bowman	1	1	2	5	10	10	1	1	2	7	12	16	68
Burke	1	1	2	5	5	10	1	1	3	6	7	17	60
Burleigh	17	12	21	35	38	54	19	16	25	54	89	163	543
Cass	23	21	31	52	69	98	25	21	39	86	123	249	836
Cavalier	3	2	4	10	13	17	2	2	5	11	15	34	119
Dickey	2	2	6	9	16	23	2	2	5	13	17	33	130
Divide	1	2	3	5	5	8	1	1	3	6	6	16	57
Dunn	1	1	2	4	4	5	1	1	2	4	6	8	38
Eddy	1	1	2	6	7	13	1	1	3	6	10	18	71
Emmons	2	2	3	6	9	16	2	2	3	7	10	20	81
Foster	1	1	2	6	9	16	2	1	3	9	13	22	86
G Valley	1	1	1	3	3	4	1	1	2	4	2	12	34
G Forks	10	11	18	30	42	57	11	11	21	57	85	163	517
Grant	1	1	2	6	6	7	1	1	2	6	9	10	53
Griggs	1	1	2	5	5	8	2	1	2	6	8	14	57
Hettinger	1	1	3	6	7	10	1	2	3	7	9	13	63
Kidder	1	1	3	4	4	6	1	2	2	5	8	12	49
LaMoure	2	2	4	8	9	17	2	2	4	12	15	30	107
Logan	1	2	2	3	7	5	1	1	2	6	9	18	57
McHenry	3	2	4	12	13	19	2	3	4	12	22	33	130
McIntosh	2	2	4	9	12	20	2	2	4	11	18	36	122
McKenzie	2	2	3	7	5	5	2	2	4	7	7	9	54
McLean	4	4	8	16	17	21	3	4	9	21	24	27	158
Mercer	4	3	6	8	8	13	3	3	6	12	12	20	100
Morton	10	6	10	18	18	25	8	7	15	34	51	85	287
Mountrail	2	2	5	11	11	15	2	2	5	11	18	35	120
Nelson	2	2	4	10	12	23	3	2	5	11	15	34	124
Oliver	1	1	1	1	1	2	1	0	1	2	2	3	13
Pembina	3	3	6	13	17	29	3	3	6	15	24	58	182
Pierce	2	2	3	8	11	14	2	2	4	11	17	31	107
Ramsey	5	4	8	15	19	29	4	4	9	24	34	65	219
Ransom	2	3	5	9	12	17	2	2	4	9	14	35	115
Renville	1	1	2	4	7	12	1	1	2	6	10	18	64
Richland	5	5	9	19	24	37	6	5	10	27	37	69	254
Rolette	3	3	6	11	13	16	3	3	6	12	18	31	126
Sargent	2	2	2	5	7	11	2	1	3	7	10	19	72
Sheridan	1	1	1	2	2	5	1	1	2	3	5	7	31
Sioux	1	1	1	1	1	3	1	1	1	1	2	3	16
Slope	0	0	1	1	1	1	0	0	0	1	1	2	9
Stark	9	6	11	25	31	38	8	7	12	27	39	70	282
Steele	1	1	2	3	4	4	1	1	2	3	4	10	35
Stutsman	7	6	9	18	23	36	8	5	10	26	41	82	270
Towner	1	1	2	5	9	11	1	1	2	7	13	23	78
Traill	3	3	6	14	16	27	3	3	7	16	25	67	194
Walsh	4	4	8	15	19	28	5	5	11	23	37	75	234
Ward	9	8	19	40	51	69	11	10	24	63	89	143	537
Wells	2	2	5	12	16	27	2	2	5	14	21	41	149
Williams	6	5	10	21	18	26	6	5	11	25	38	77	248
State	180	161	294	587	731	1,040	185	172	343	810	1,190	2,228	7,916

Note: Due to rounding, the numbers listed in the "Total" column and the "State " row may not be exactly equal to their respective sums of AD cases by age and sex.

APPENDIX TABLE 10. HIGH-SERIES ESTIMATED NUMBER OF PERSONS WITH ALZHEIMER'S DISEASE IN NORTH DAKOTA BY GENDER, AGE, AND COUNTY, 1995

County	Males						Females						Total
	60-64	65-69	70-74	75-79	80-84	85+	60-64	65-69	70-74	75-79	80-85	85+	
Adams	1	1	1	4	8	14	1	1	2	6	7	14	60
Barnes	4	4	9	18	27	46	4	4	9	24	39	91	278
Benson	2	2	4	9	12	19	2	2	4	8	12	25	101
Billings	0	0	0	1	0	0	0	0	0	0	0	0	4
Bottineau	2	2	5	12	17	18	2	3	6	15	25	63	170
Bowman	1	1	2	4	9	17	1	1	2	6	13	25	83
Burke	1	1	2	3	5	9	1	1	2	6	8	19	60
Burleigh	18	15	24	41	46	64	22	19	33	61	96	219	658
Cass	23	21	36	63	70	113	25	23	42	90	135	273	915
Cavalier	3	2	4	7	14	16	2	2	5	11	16	36	119
Dickey	2	2	4	12	15	26	2	2	4	13	21	39	142
Divide	1	1	3	5	5	11	1	1	2	7	8	19	63
Dunn	1	1	2	3	4	4	1	1	2	5	5	12	41
Eddy	1	1	2	5	9	12	1	1	2	7	10	20	72
Emmons	2	2	3	5	8	15	2	2	4	6	9	22	79
Foster	1	1	3	6	9	19	2	1	3	8	15	33	101
G Valley	1	1	1	2	4	3	0	1	1	4	6	6	30
G Forks	7	9	18	34	43	61	9	10	23	52	95	177	538
Grant	1	1	2	3	7	8	1	1	2	5	9	17	58
Griggs	1	1	2	4	7	7	1	1	3	5	9	16	58
Hettinger	1	1	3	5	8	12	1	1	3	6	12	18	72
Kidder	1	1	2	5	4	7	1	1	3	5	9	16	54
LaMoure	1	2	4	7	10	19	2	2	4	9	18	37	115
Logan	1	1	3	4	5	5	1	1	2	4	11	17	55
McHenry	2	2	4	8	17	19	2	2	5	9	22	37	129
McIntosh	2	2	5	10	12	24	2	2	4	10	18	38	129
McKenzie	2	1	3	6	7	7	2	2	3	7	9	12	62
McLean	4	4	8	16	19	29	3	3	8	22	31	43	188
Mercer	7	5	7	10	12	13	5	4	6	13	19	22	123
Morton	9	9	11	19	21	26	8	8	15	38	59	106	329
Mountrail	1	2	4	9	15	21	2	2	5	13	19	47	139
Nelson	2	2	4	9	15	23	2	3	6	11	18	37	131
Oliver	1	0	1	1	1	1	1	0	1	2	1	4	14
Pembina	3	3	6	13	19	30	3	3	7	15	25	56	182
Pierce	2	2	3	8	9	20	2	2	4	8	19	44	121
Ramsey	4	4	8	16	21	31	4	4	9	21	38	80	241
Ransom	2	2	6	9	13	16	2	2	3	9	14	14	111
Renville	1	1	2	3	5	16	1	1	2	4	9	27	70
Richland	4	5	10	20	24	43	5	5	10	24	39	80	270
Rolette	4	3	7	13	14	21	4	3	7	15	20	40	151
Sargent	1	2	3	5	6	10	1	1	2	6	11	23	71
Sheridan	1	1	1	2	2	3	1	1	1	3	4	10	30
Sioux	1	1	1	2	1	2	1	0	1	2	1	5	17
Slope	0	0	0	1	1	0	0	0	0	1	1	2	7
Stark	8	8	12	27	40	48	8	8	14	31	44	95	344
Steele	1	1	1	3	3	4	1	1	2	3	4	8	32
Stutsman	6	6	9	16	22	37	7	7	9	21	40	76	256
Towner	1	1	2	6	7	14	1	1	3	6	11	32	84
Traill	2	3	5	12	19	26	3	3	7	18	29	69	195
Walsh	4	4	7	15	18	31	4	4	9	27	37	87	247
Ward	9	8	16	40	52	96	8	9	22	55	107	200	618
Wells	2	2	4	10	17	30	2	2	4	13	21	47	155
Williams	5	5	9	19	29	27	5	5	11	24	46	83	268
State	181	183	296	590	791	1,194	172	173	243	793	1,302	2,658	8,639

Note: Due to rounding, the numbers listed in the "Total" column and the "State" row may not be exactly equal to their respective sums of AD cases by age and sex.

APPENDIX TABLE 11. HIGH-SERIES ESTIMATED NUMBER OF PERSONS WITH ALZHEIMER'S DISEASE IN NORTH DAKOTA BY GENDER, AGE, AND COUNTY, 2000

County	Males						Females						Total
	60-64	65-69	70-74	75-79	80-84	85+	60-64	65-69	70-74	75-79	80-85	85+	
Adams	1	1	1	3	7	14	1	1	1	5	9	13	56
Barnes	4	4	5	19	27	46	3	4	6	21	39	88	265
Benson	2	2	2	7	12	18	2	2	3	8	11	23	92
Billings	0	0	0	0	0	0	0	0	0	0	0	0	1
Bottineau	2	2	3	10	15	19	2	2	4	15	24	62	161
Bowman	1	1	2	4	7	17	1	1	2	6	11	27	81
Burke	1	1	1	3	4	9	1	1	2	5	8	22	57
Burleigh	22	16	22	47	55	77	26	22	27	80	108	226	730
Cass	25	22	27	73	85	115	27	23	33	97	142	301	970
Cavalier	2	2	3	7	11	18	2	2	3	11	16	37	115
Dickey	2	2	3	9	21	25	2	2	3	10	21	48	147
Divide	0	1	1	5	6	12	1	1	1	4	8	24	63
Dunn	2	1	1	3	3	5	1	1	1	4	6	11	39
Eddy	1	1	2	5	7	15	1	1	2	6	12	19	69
Emmons	1	1	2	5	7	14	1	1	2	7	9	20	73
Foster	1	1	2	6	9	20	1	1	2	7	14	38	103
G Valley	1	0	1	2	3	5	1	0	1	3	5	15	37
G Forks	6	6	11	36	48	62	7	8	15	55	87	197	536
Grant	1	1	1	4	4	10	1	1	1	5	7	16	52
Griggs	1	1	1	4	5	9	1	1	2	6	7	19	57
Hettinger	1	1	1	5	7	13	1	1	2	7	10	26	75
Kidder	1	1	1	3	6	7	1	1	1	6	8	18	53
LaMoure	2	1	2	6	9	21	1	2	3	9	13	46	115
Logan	1	1	1	4	5	3	1	1	2	4	8	21	54
McHenry	2	2	3	7	11	24	3	2	3	10	16	37	119
McIntosh	1	2	3	12	14	25	1	2	3	8	17	39	128
McKenzie	2	2	2	5	7	11	2	1	2	7	10	16	67
McLean	6	4	5	15	19	32	3	3	5	18	32	54	195
Mercer	12	7	7	12	15	19	6	5	6	14	20	35	158
Morton	11	8	11	21	22	31	9	8	13	19	65	122	360
Mountrail	1	1	2	7	12	28	1	1	2	11	23	48	140
Nelson	2	2	3	9	13	29	2	2	4	13	17	43	140
Oliver	1	1	0	1	1	1	1	0	1	1	1	4	13
Pembina	3	3	4	12	19	34	3	3	4	15	25	59	184
Pierce	2	2	2	7	9	17	2	2	3	9	14	47	115
Ramsey	4	4	6	18	22	35	4	3	6	23	35	90	249
Ransom	2	2	3	11	13	17	1	2	3	7	13	33	107
Renville	1	1	1	3	4	11	1	1	1	4	5	25	58
Richland	5	4	7	22	25	42	4	5	8	23	35	84	263
Rolette	4	4	5	15	16	23	3	4	5	16	25	44	162
Sargent	1	1	2	5	6	9	1	1	2	6	9	24	66
Sheridan	1	1	1	2	2	3	1	1	1	3	4	7	26
Sioux	1	1	1	2	1	3	1	1	0	1	2	3	17
Slope	0	0	0	0	1	0	0	0	0	1	1	1	6
Stark	10	3	11	29	44	62	9	9	12	36	49	107	387
Steele	0	1	1	3	3	4	1	1	1	3	4	7	29
Stutsman	7	5	7	16	20	26	6	6	8	18	33	74	236
Towner	1	1	1	5	8	11	1	1	1	7	9	25	71
Traill	3	2	4	11	17	31	3	3	4	16	31	70	194
Walsh	4	3	5	12	19	30	4	4	6	22	42	87	238
Ward	5	5	10	33	53	95	6	7	14	50	93	241	612
Wells	2	2	3	9	14	33	2	2	3	11	19	49	148
Williams	7	6	7	17	25	43	5	4	8	23	45	100	290
State	179	147	216	594	796	1,290	173	163	247	795	1,275	2,906	8,786

Note: Due to rounding, the numbers listed in the "Total" column and the "State" row may not be exactly equal to their respective sums of AD cases by age and sex.

APPENDIX TABLE 12. NUMBER OF MALES AND FEMALES ADMITTED TO NORTH DAKOTA HOSPITALS WITH DEMENTIA OR WITH ALZHEIMER'S DISEASE BY AGE, 1985.

Age	All Dementias						Alzheimer's Disease					
	Total		Male		Female		Total		Male		Female	
	N	%	N	%	N	%	N	%	N	%	N	%
Less Than 60	9	1.65	4	1.57	5	1.71	2	1.63	2	3.70	0	0.00
60-64	9	1.65	2	0.78	7	2.40	3	2.44	0	0.00	3	4.35
65-69	14	2.56	9	3.53	5	1.71	4	3.25	2	3.70	2	2.90
70-74	50	9.14	34	13.33	16	5.48	12	9.76	6	11.11	6	8.70
75-79	109	19.93	57	22.35	52	17.81	32	26.02	15	27.78	17	24.64
80-84	120	21.94	56	21.96	64	21.92	38	30.89	16	29.63	22	31.88
85-89	121	22.12	55	21.57	66	22.60	16	13.01	6	11.11	10	14.49
90-94	81	14.81	27	10.59	54	18.49	15	12.20	6	11.11	9	13.04
95-99	27	4.94	9	3.53	18	6.16	1	0.81	1	1.85	0	0.00
100+	7	1.28	2	0.78	5	1.71	0	0.00	0	0.00	0	0.00
	547	100.02	255	99.99	292	99.99	123	100.01	54	99.99	69	100.00

SOURCE: North Dakota Medicare/Medicaid 1985 hospital patients with dementia (ICDA 290.0-290.9, 291.2, 294.0, 294.1, 294.8, 294.9, 331.0-331.2, 797): North Dakota State Department of Health, Bismarck, ND.

APPENDIX TABLE 13. NUMBER OF PERSONS ADMITTED TO NORTH DAKOTA HOSPITALS WITH DEMENTIA OR WITH ALZHEIMER'S DISEASE BY COUNTY, 1985.

North Dakota Counties	Dementia		Alzheimer's Disease (ICDA 331.0)		Alzheimer's Disease as a Percent of All Dementias
	N	%	N	%	%
Adams	4	0.73	0	0.00	0.00
Barnes	17	3.11	3	2.44	17.64
Benson	5	0.91	0	0.00	0.00
Billings	1	0.18	0	0.00	0.00
Bottineau	6	1.10	1	0.81	16.67
Bowman	0	0.00	0	0.00	-----
Burke	5	0.91	1	0.81	20.00
Burleigh	36	6.58	8	6.50	22.22
Cass	47	8.59	13	10.57	27.69
Cavalier	5	0.91	0	0.00	0.00
Dickey	3	0.55	0	0.00	0.00
Divide	9	1.65	8	6.50	88.89
Dunn	2	0.37	1	0.81	50.00
Eddy	2	0.37	1	0.81	50.00
Emmons	8	1.46	0	0.00	0.00
Foster	4	0.73	1	0.81	25.00
G Valley	0	0.00	0	0.00	0.00
G Forks	23	4.20	7	5.69	30.44
Grant	4	0.73	1	0.81	25.00
Griggs	1	0.18	0	0.00	0.00
Hettinger	6	1.10	2	1.63	33.33
Kidder	2	0.37	1	0.81	50.00
LaMoure	6	1.10	0	0.00	0.00
Logan	3	0.55	0	0.00	0.00
McHenry	7	1.28	2	1.63	28.57
McIntosh	9	1.65	1	0.81	11.11
McKenzie	1	0.18	0	0.00	0.00
McLean	18	3.29	2	1.63	11.11
Mercer	6	1.10	1	0.81	16.67
Morton	19	3.47	9	7.32	47.37
Mountrail	11	2.01	3	2.44	27.27
Nelson	8	1.46	1	0.81	12.50
Oliver	1	0.18	0	0.00	0.00
Pembina	11	2.01	9	7.32	81.82
Pierce	1	0.18	0	0.00	0.00
Ramsey	16	2.93	1	0.81	6.25
Ransom	6	1.10	1	0.81	16.67
Renville	14	2.56	1	0.81	7.14
Richland	2	0.37	0	0.00	0.00
Rolette	9	1.65	5	4.07	55.56
Sargent	1	0.18	0	0.00	0.00
Sheridan	2	0.37	0	0.00	0.00
Sioux	0	0.00	0	0.00	-----
Slope	0	0.00	0	0.00	-----
Stark	22	4.02	3	2.44	13.64
Steele	0	0.00	0	0.00	-----
Stutsman	26	4.75	1	0.81	3.85
Towner	6	1.10	3	2.44	50.00
Traill	3	0.55	1	0.81	33.33
Walsh	17	3.11	4	3.25	23.53
Ward	42	7.68	7	5.69	16.67
Wells	17	3.11	4	3.25	23.53
Williams	20	3.66	4	3.25	20.00
States					
Minnesota	41	7.50	10	8.13	24.39
Montana	4	0.73	2	1.63	50.00
South Dakota	7	1.28	0	0.00	0.00
Other unspecified states	1	0.18	0	0.00	0.00
TOTAL	547	100.02	123	99.97	22.49

SOURCE: North Dakota Medicare/Medicaid 1985 hospital patients with dementia (ICDA 290.0-290.9, 291.2, 294.0, 294.1, 294.8, 294.9, 331.0-331.2, 797): North Dakota State Department of Health, Bismarck, ND.

APPENDIX TABLE 14. NUMBER OF REPORTED ALZHEIMER'S DISEASE RELATED DEATHS IN NORTH DAKOTA COUNTIES, 1979 TO 1985 AND PERCENT OF TOTAL POPULATION OVER AGE 65, 1980

County	Number of Reported Alzheimer's Disease Related Deaths		Percent of Total Population Over Age 65
	1979-1984	1985	
Adams	-	-	16.3
Barnes	3	1	17.2
Benson	-	-	14.8
Billings	-	-	8.5
Bottineau	1	1	17.5
Bowman	-	-	13.5
Burke	-	-	19.3
Burleigh	3	4	8.4
Cass	7	5	9.6
Cavalier	-	-	17.1
Dickey	-	-	17.1
Divide	1	1	20.2
Dunn	-	-	11.5
Eddy	-	-	20.5
Emmons	-	-	15.5
Foster	-	-	16.5
G Valley	-	-	16.1
G Forks	3	1	7.9
Grant	1	-	15.5
Griggs	-	1	20.1
Hettinger	1	-	15.9
Kidder	-	-	14.4
LaMoure	-	-	18.1
Logan	-	-	16.7
McHenry	-	-	18.4
McIntosh	-	-	22.9
McKenzie	1	2	10.4
McLean	-	-	14.4
Mercer	-	-	10.2
Morton	1	1	10.8
Mountrail	1	-	15.4
Nelson	-	-	23.0
Oliver	-	-	8.4
Pembina	-	1	16.5
Pierce	-	-	18.1
Ramsey	1	-	16.0
Ransom	-	-	19.1
Renville	1	-	17.4
Richland	1	-	14.4
Rolette	-	-	9.4
Sargent	2	-	14.8
Sheridan	-	-	16.2
Sioux	-	-	5.4
Slope	-	-	11.3
Stark	1	-	9.8
Steele	-	-	16.3
Stutsman	3	1	13.4
Towner	-	-	19.8
Traill	-	-	19.2
Walsh	-	-	16.4
Ward	3	2	9.0
Wells	-	-	20.2
Williams	1	-	10.9
State	36	21	12.3

SOURCES: Bureau of the Census 1982; North Dakota State Department of Health, 1986.

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